CLAIMS

We claim:

1. A method comprising:

dividing an input image and an output image into blocks, wherein each block in the output image corresponds to one block in the input image;

calculating a color average of each input block;

calculating a set of output colors for each block in the output image to match the color average of its corresponding block in the input image; and

generating an indication to control positioning of the set of output colors in said each block of the output image.

2. The method defined in Claim 1 further comprising dividing each input and output block into subblocks in response to a certain criteria being met.

3. The method defined in Claim 2 wherein the criteria for dividing a block into subblocks is whether the block contains an edge.

4. The method defined in Claim 1 wherein characteristics of the block are such that a human eye averages colors associated with the block.

5. The method defined in Claim 4 wherein the characteristics include one or more of size, shape and expected viewing distance.

6. The method defined in Claim 1 wherein calculating the set of output colors is performed by examining possible values achievable in a color space and locating an achievable value closest to the color average of the corresponding input block.

7. The method defined in Claim 1 wherein calculating the set of output colors comprises using a look-up table on the average color to determine output colors in the set.

8. The method defined in Claim 7 wherein the average color distance output color is the set either exactly or approximately.

9. The method defined in Claim 1 wherein calculating the set of output colors comprises using integer programming.

10. The method defined in Claim 1 wherein calculating the set of output colors comprises using dynamic programming.

11. The method defined in Claim 1 wherein calculating the set of output colors comprises using an approximate linear programming solution.

12. The method defined in Claim 1 wherein calculating the set of output colors comprises using an approximate maximum entropy solution.

13. The method defined in Claim 1 wherein dividing a block into subblocks comprises:

calculating a function of the color value for each block and for each of a plurality of subblocks in said each block;

determining if the distance between the function of the color value of the block and subblocks is greater than a threshold; and

dividing the block into subblocks if the difference is greater than the threshold.

14. The method defined in Claim 13 further comprising determining an edge exists by comparing a function of color values for each subblock to the function's value for the other subblocks of the block.

15. The method defined in Claim 13 wherein the plurality of subblocks comprises four subblocks.

16. The method defined in Claim 1 further comprising positioning colors within each block to match a target color and reduce spatial artifacts given the set of output colors.

17. The method defined in Claim 16 wherein tessellating colors within each block comprises performing regular gridding.

18. The method defined in Claim 16 wherein tessellating colors within each block comprises using a dither matrix ordering of the chosen output colors.

19. An article of manufacture having a recordable medium storing executable instructions which, when executed by a system causes the system to perform the steps of Claim 1.

20. An apparatus comprising:

a divider to divide an input image and an output image into blocks, wherein each block in the output image corresponds to one block in the input image;

first logic to calculate a color average for each input block;

second logic to calculate a set of output colors for each block in the output image to match the color average of its corresponding block in the input image; and

indication generation logic to generate an indication to control positioning of the set of output colors in said each block of the output image.

21. The apparatus defined in Claim 20 wherein the divider divides each input and output block into subblocks in response to a certain criteria being met.

22. The apparatus defined in Claim 20 wherein the criteria for dividing a block into subblocks is whether the block contains an edge.

23. The apparatus defined in Claim 19 wherein characteristics of the block are such that a human eye averages colors associated with the block.

24. The apparatus defined in Claim 23 wherein the characteristics include one or more of size, shape and expected viewing distance.

25. The apparatus defined in Claim 19 wherein the logic to calculate the set of output colors examines possible values achievable in a color space and locates an achievable value closest to the color average of the corresponding input block.

26. The apparatus defined in Claim 19 wherein the logic to calculate the set of output colors uses a look-up table on the average color to determine output colors in the set.

27. The apparatus defined in Claim 26 wherein the average color distance output color is the set either exactly or approximately.

28. The apparatus defined in Claim 19 wherein the logic to calculate the set of output colors uses integer programming.

29. The apparatus defined in Claim 19 wherein the logic to calculate the set of output colors uses dynamic programming.

30. The apparatus defined in Claim 19 wherein the logic to calculate the set of output colors uses an approximate linear programming solution.

31. The apparatus defined in Claim 19 wherein the logic to calculate the set of output colors uses an approximate maximum entropy solution.

32. The apparatus defined in Claim 19 further comprises:

calculation logic to generate a function of the color value for each block and for each of a plurality of subblocks in said each block;

determination logic to determine if the distance between the function of the color value of the block and subblocks is greater than a threshold; and

a divider to divide the block into subblocks if the difference is greater than the threshold.

33. The apparatus defined in Claim 32 further comprising determination logic to determine an edge exists by comparing a function of color values for each subblock to the function's value for the other subblocks of the block.

34. The apparatus defined in Claim 32 wherein the plurality of subblocks comprises four subblocks.

35. The apparatus defined in Claim 19 further comprising control logic to position colors within each block to match a target color and reduce spatial artifacts given the set of output colors.

36. The apparatus defined in Claim 35 wherein the control logic performs regular gridding within each block.

37. The apparatus defined in Claim 36 wherein the control logic performs dither matrix ordering of the chosen output colors within each block.

38. An apparatus comprising:

means for dividing an input image and an output image into blocks, wherein each block in the output image corresponds to one block in the input image;

means for calculating a color average of each input block;

means for calculating a set of output colors for each block in the output image to match the color average of its corresponding block in the input image; and

means for generating an indication to control positioning of the set of output colors in said each block of the output image.

39. A method comprising:

dividing the input image and the output image into blocks comprises adaptively sizing blocks with edges to create a plurality of blocks without edges; and

computing a set of output colors that best renders a color average of the input image for the corresponding block.

40. The method defined in Claim 39 wherein the input image's color gamut is pre-warped to adjust for the output color gamut.

41. An apparatus comprising:

means for dividing the input image and the output image into blocks comprises means for adaptively sizing blocks with edges to create a plurality of blocks without edges; and

means for computing a set of output colors that best renders a color average of the input image for the corresponding block.

42. The apparatus defined in Claim 39 wherein the input image's color gamut is pre-warped to adjust for the output color gamut.

43. An apparatus comprising:

a divider to divide the input image and the output image into blocks by means for adaptively sizing blocks with edges to create a plurality of blocks without edges; and

computation logic to compute a set of output colors that best renders a color average of the input image for the corresponding block.